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CHANGE AND FAMILY FACTORS AND THEIR RELATIONSHIP TO CHILD'S I.Q. SCORES

by

© ESTHER CHEN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF EDUCATION

IN

COUNSELLING PSYCHOLOGY

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"Do not forget the most important fact that not heredity and not environment are determining factors. Both are giving only the frame and the influences which are answered by the individual in regard to his styled creative power."

"As long as the individual has a feeling that he belongs he can devote his energy to meet the needs of the situaiton."

A. Adler

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled CHANGE AND FAMILY FACTORS AND THEIR RELATIONSHIP TO CHILD'S I.Q. SCORES submitted by Esther Chen in partial fulfilment of the requirements for the degree of Master of Educational Psychology.

.....
Supervisor

.....

.....

Date June. 17. 1983

To two dear persons who passed away during the time that I was working on the thesis. My father Zvi Fried who was an example for me by being a very good, and modest person, who liked to work and worked hard all during his life. To my nephew Ra'anan Fried who bravely fought against a terrible illness at the age of 11.

To my dear and loved mother Fried Magda with much appreciation, wishing her a long, happy and healthy life.

ABSTRACT

The main purpose of this study was to investigate the sensitiveness of the development of the intellectual ability, and also specific cognitive factors of the child who goes through certain changes in life, in our case, divorce of the parents, and moving of the family. Family variables such as birth order, sex, family size, space and age were considered as possible contributor factors in predicting the development of the intellectual ability of the child. A sample of 190 children age 6 to 18 were referred to the Child and Family Clinic for intellectual assessment. The sample included 48 children from divorced parents, and 86 children from families who had moved.

In order to support the existence of relationships between family factors and I.Q. Full Scale and the three factors of the WISC-R, two tests of correlation were conducted. A multiple linear regression analysis was conducted in order to find which family factors predicted the Full Scale I.Q. and the three factors of the WISC-R.

An analysis of I.Q. means was made in order to find difference between sub-groups of divorced, not-divorced, and moved, not-moved, according to their given family variables. Lastly, a three-way analysis of variance was conducted in order to find differences between factors such as marital status, mobility of the family, birth order, and sex.

Significant correlations ($p<.05$) was found between moving and I.Q. Full Scale, there were found no other significant correlations between the rest of the family variables, and I.Q. Full Scale. Furthermore, no significant correlations were found between the family variables and the three factors of WISC-R.

The moving factor was the major contributor in predicting the Full Scale I.Q. None of the family variables reached statistical significance in predicting the Full Scale I.Q. or the specific cognitive factors of the WISC-R. It was concluded that a difference exists between means in I.Q. for the divorced, not-divorced, moved, and not-moved sub-groups.

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CHAPTER I

INTRODUCTION

This study was designed to investigate a relationship between family factors, such as birth order, sex, age, space, family size, moving (in the same country), marital status and I.Q. Thus, in this study it was hypothesized that the family factors would predict the Full Scale I.Q., and also the three factors of the WISC-R (verbal comprehension, perceptual organization, freedom from distraction). Very little research has been conducted in order to test whether family factors, mobility, and marital status are related to I.Q. Furthermore, little research in this area has been done with clinical populations.

We have assumed that we can find support to our hypotheses in Adler's theory. Adler's theory (Adler, 1932) perceives the individual as a whole. The individual's goal is directed through his interaction with his environment, and his striving for belongingness. His feeling of belongingness starts to grow toward his family, and later it extends toward the larger, extended environment. Through his life, a child develops his social interest and life style in order to interact with the environment. The primary source of his life style and his social interest is the family environment and specifically the birth order.

Since Galton (1874) reported that first borns were over represented among eminent men of science, the findings of

academic and achievement superiority of the first born has been replicated by hundreds of studies all over the world. Belmont (1915) found that birth order was related to intellectual performance. His study included 400,000 men. The second of these large sample studies was carried out by Breland (1974) using 800,000 participants. He concluded that birth order is related to achievement. Broley (1976) reported an overrepresentation of first borns in colleges throughout the country. Roslyn and Branzaft (1980) concluded that birth order does not appear to be critical to intellectual achievement if the families value education, and where the children are intellectually well endowed. However, there is not always agreement, in the studies' findings, concerning the causes of these consistent observations.

Schooler (1972), Barry and Brazy (1976), Murphy and Newcom (1978) and Zajnoc and Markus (1975) have suggested a more sophisticated design for the studies. They consider it necessary to examine more variables than birth order, such as sibling's sex, demography, family size, sex, and space between siblings. Nevertheless, their findings do not completely oppose the birth order factor, but they suggested consideration of other family factors as well, in order to reach a conclusion about the relationship between family factors and intellectual development.

The intellectual factor of the individual is a part of the wholism of the individual, and is used by him as a tool to relate to his environment. We have assumed that there is

an interaction between the development of intellectual factors, and the way he would react to his environment. Within a changing situation in the child's environment, such as moving or divorce of parents, his feeling of belongingness is threatened. Therefore, this could affect his intellectual development.

The concept of a rootless, alienated society has been adequately described by Packard (1972) and Toffler (1970). They indicated that mobility contributes to psychological and social ills. However, Geobel's (1981) study shows that very few investigations of relationship between mobility and cognitive development have been carried out. There is not always agreement concerning the results of moving on the child's intellectual development.

It is also assumed in our society that marital changes, and single-parent families affect the development of the child. Sugar (1970) concluded that father's absence from home makes no difference to the child's school achievement. Maxwell's (1961) findings concluded no significant difference when he measured 292 children aged 8 to 13 years on the WISC-R, and compared father present children with father absent children. Hess and Camara (1979) findings showed the same results. In addition, Lessign, Zagorin and Nelson (1978) reported that among middle class subjects, the father absent children earned significantly higher mean verbal I.Q. than father present children, but children of working class had lower mean verbal I.Q. and full-scale I.Q. score in cases

of father absent than had in cases of father present.

This study was designed to explore the relationship between an assumed diminished feeling of belongingness of the child because of change in family and other contributors (family factors) and cognitive ability. These environmental and cognitive factors might be related to the general ability of the individual to respond to the environment. Given the conception of "intelligence" as the capacity of an individual to respond to and adjust to his environment, it is hypothesized that family factors such as birth order, number of siblings, sex, age, marital status and number of change situations (moves) will be predictive of cognitive abilities. It is proposed that this study will examine the relationships within a clinical population, the sample comprised entirely of children and adolescents referred to a clinic for assessment purposes, thus limiting the generalizations to the general population. Adler's theoretical framework will be used to conceptualize the research findings.

CHAPTER II

GENERAL THEORY

Part 1

The Feeling of Belongingness

According to Adler, love in all its thousands of variations, is a feeling of belonging, and hence is characterized by its content as a social feeling. Adler said that "The feeling of belongingness, and the social interest takes root in the psyche of the child very early in his life" (Ansbacher, 1921, p. 138). A man is a social being and can fully function only with a group. As long as he has a feeling that he belongs he can devote his energy to meet the needs of the situation. The feeling of belongingness should be started and well established by the child toward his family early in life. It means learning how to take responsibilities and not making him dependent if there is no need for it. It is the parent's responsibility to help the child set up patterns, compatible to the child's needs. However, the child's first responsibility is to adjust to the family schedule, and the next responsibility of the child is to contribute to the family welfare. As Adler put it "The degree and the extent of belonging depends on the development of his social interest" (Ansbacher, 1921, p. 138).

The feeling of belongingness is an expression of interaction between the individual and his environment, a give and take relationship. The ability of the individual to accept the outside world and at the same time to be able to contribute to it. To be a part of something, and to be interested in others without losing the feeling of his own individuality. Belongingness is a positive feeling through which he is motivated to respond creatively to his environment. This is a process of giving.

The Social Interest

Adler's term for social interest, "Gemeinschaftsgefuhl", presented difficulty to the translators. The following terms have been used as English equivalents: social feeling, community feeling, fellow feeling, social sense and social interest. According to Adler the function of the family is to develop the potentiality of the child, and to spread social interest. The educability of the child drives from the breadth of his innate, differentiated, and growing social interest. Through it he gains the connection with the common ideal. In this way the demands of the community, the individual's environment, become personal demands, and the imminent logic of human society. According to Adler

> Social interest remains throughout life. It becomes differentiated, limited, or expaned and, in favorable cases, extends beyond the family members to the larger group, to the nation, to all of mankind. It can ever go further, extending itself even to the cosmos. (Ansbacher, 1924, p. 139)

While Adler recognized the necessity for developing social interest, a cornerstone of his theory is the assertion that this development applies to an innate disposition for other directedness. Social concern becomes in this way a primary rather than a secondary phenomenon.

While social interest must be developed in the child, it does not mean that we always proceed in accordance with social interest. However, according to Adler "We can never find anyone who could say truly: 'I am not interested in others.' He may act this way, but he cannot justify himself" (Ansbacher, 1924, p. 140). Criminals, for instance, always make excuses or accuse others. (They speak of the cruelty of society in not supporting them.) In our society, specifically in modern ones, the first major responsibility of an individual is to co-operate in the attainment of the group's goal, after practising it in his family. According to Adler "We are not the very first, but we are the first to have strongly emphasized the basic nature of social interest" (Ansbacher, 1921, p. 141). Adler's stress on the necessity for developing the innate potentiality for social interest might be misunderstood to mean that everybody should become someone special. It does not always manifest itself in concrete participation. Secondly, the society to which the individual contributes is not limited to any specific present day or group but is indicated in a broader sense as the abstract concept of some future ideal society.

The term "social interest" explains how the individual becomes responsive to reality. It is a part of the individual's equipment to be able to adjust and to belong. All problems in our lives are social problems, and these can be solved only if we are interested in others. The criminal personality is a person on whom the social interest is not sufficiently developed. We also can look at it as a misinterpretation of the social interest, and his failure feelings are replaced by revenge. Since, according to Adler's theory, a person acts according to his conviction, in a case of a criminal, those are regarding mistaken beliefs.

This basic conviction fills in the following blanks: "I am . . . . life is . . . . therefore." Thus, from experience and knowledge of a few facts, we can tell (for example) what will be the goal of the individual. What will happen to children who always separate themselves from others, who are looking for support, who are pampered and who hesitate in approaching situations.

The Life Style

Adler very early in his work found the individual to be a unity in his thinking, feeling, acting, consciousness and unconsciousness, in every expression of his personality. The wholism of the individual as it appears in all its manifestations, Adler called the style of life of the individual. Every individual represents both a unity of personality, and the individual fashioning of that unity. In

order to understand how the style of the life created, and how a person makes his movement consciously or unconsciously, according to Adler, we should follow the early childhood period. What is happening in the family and how. One of Adler's very important beliefs is that "Every child is born with potentialities different from those of any other child" (Ansbacher, 1930, p. 176). However, the important thing is not what one is born with, but what use one makes of that equipment. Who can say that the same environmental influences are worked, and responded to by any two individuals the same way? Everyone carries within himself an opinion of himself, and the problems of life, and a law of movement which keeps fast hold of him without his understanding it. The style of life in Adler's late writing is based on the individual's "law of movement". The law of movement in the mental life of a person is the decisive factor for his individuality. We can make predictions in this way because we know the phases, and the questions of life. This becomes useful in attempting to predict the future interaction of an individual with his environment under a given set of circumstances.

The Creative Power

Adler said that it is necessary to assure the existence of still another force, the creative power of the individual. The creative power is felt by the child as an impulse that gives his striving a certain direction. A movement he makes

by all his potentialities toward the overcoming of an obstacle, or the goal which he creates in response to his environment. This response is not a passive reaction but a manifestation of creative activity on the part of the individual. As Adler put it "In the first place, we can never regard a person other than a self-consistent being, and thus, as a goal-directed and purposeful whole" (Ansbacher, 1930, p. 177). Out of life arises needs, and every individual responds by his own creative power toward his goal.

The first four to five years are enough for the child to complete his specific training to face the environment. From then on the creative activity of the style of life begins its work. In the first two years of his life the child starts in the direction of a final goal as he comes to find himself. How does the child attempt to cope with his environment in order to find a place for himself? How does he attempt to feel belonged? Here his creative power becomes effective, from trial and error the child finds himself in a situation which he is happy with or unhappy. Hence, he will strive in the future to develop a direction which will be suitable for him. Adler said that "It is difficult to say how this goal is fixed, but it is obvious that such a goal exists, and that it dominates the child's every movement" (Ansbacher, 1930, p. 187). There are thousands of possibilities in the realm of freedom and error. The child, from his own experience with the environment, and by the

using of his own creative power, obtains a style of life. He is not changed as long as the individual does not understand why he acts in a certain way toward his goal. Even then sometimes he cannot help it, so he acts as he can and not as he wants to.

The Birth Order

Adler understood child development in terms of its social context. The social fields of the child included not only its parents but also its siblings.

Adler first presented his views on birth order in 1918 Birth Order is a fact, a given (Ansbacher, 1930, p. 382), Adler felt, leaving an imprint which is recognizable even in adult life, affecting adult personality. The impact of the family upon the personality of the child, the interactions which he experiences, would lead him to evaluating the world outside the family. The knowledge, habits and skill which he acquires in the home largely determine his capacity for dealing with outside situations. It is not the actual order of birth, but the psychological situation which is important. Adler described five basic positions. There are the first born, second, middle, youngest and only one. Adler said

> It is not the child's number in the order of successive births which influences his character, but the situation into which he is born and the way in which he interprets it. (Ansbacher, 1931, p. 377)

The personality is the expression of movement within the family group. This concept of the family constellation, sees

the development not so much the result of factors which converge on the child, but that of his own interpretaiton. His own concepts force them to treat him the way he expects to be treated.

Several reasons may be assumed why the family environment that surrounds each individual child varies.

1. The parents may become older and more experienced.
2. The parents may become more discouraged or encouraged, depending if they had, or had not, difficulties with their first child.
3. The financial situation of the family may have changed.
4. The parents may have moved to another neighborhood or city or even country.
5. Their marital status may have changed.

There are other possibilities that should be considered. A sickly or crippled child, a child born just before or after the death of another, on only boy among girls, an only girl among boys, an older person living in the home, or the favoritism of the parents toward a child, all these may have a profound effect on the child's environment.

The Position of the First Child

The first-born child is generally given a good deal of attention, and being thus the central interest of the family. Hence he is generally spoiled. When another child is born, usually he suffers because of the change of the situation. He is "dethroned". This expression is chosen by Adler to

describe precisely the situation, because the first child feels that he has lost his position as the centre of love and attention. He then comes into great tension, and there begins a striving to regain favor. He would like to go the best way, but good behavior would not always be noticed when everyone is busy with the new child. Thus, he tries other ways. He fights and attains his goal by unsuitable means; by needing assistance in eating or by disobedience, or by attacking the baby. The tension in certain types may produce headache, stomach trouble, etc. He will learn very soon which way is successful for him. A person of this type is always afraid of being "pushed back" all through life. He always feels jutified in fearing that a favorable situation will change. He will approach society with a hostile attitude, he may constantly be changing his occupation, and intimate friends too. Among oldest children we find individuals who strive to protect and help others. Often they play the part of a father or a mother with the younger children, look after them and teach them. Sometimes they develop a great talent for organization, or a desire to keep others dependent and rule over them. Among many people and classes an advantageous status of the oldest child has become traditional. He is the one who is expected to help and support other members in the family, especially in bad days. He is expected to show confidence, enough strength and intelligence to be constantly entrusted by others. He is usually a great believer in power and in the laws. No rule

should ever be changed. Power should always be preserved in the hands of those entitled to it. Influences like these give a strong tendency toward conservatism.

The Second Child

The second child is in a very different situation. From the time he is born, he shares attention with another child. If the oldest is not fighting against him he is very well situated. If the second child loses hope of equality he will give up and become a failure. However, the second child is in a better position than the first, because his pacemaker stimulates him to effort. It is difficult for the second, if the first child is more brilliant than the second one is. A typical second child is very easy to recognize; he behaves as if he was in a race, throughout his childhood he has a pacemaker; there is always a child ahead of him. Usually he is the opposite of the first child. Later as an adult outside of the family he may do the same, try to compete. He may become a rebel. His goal may be placed so high that he will suffer from it for the rest of his life.

The Middle Child

The middle child has an uncertain place in the family and may feel neglected. He discovers that he has not the privileges of the youngest nor the rights of an older child. He may feel unloved and may hold the conviction that people are unfair to him. He may become extremely discouraged in

his family, and may replace his family by becoming overly involved with people.

The Middle Child in a Large Family

The middle child in a large family usually develops a more stable character. In a large family, the children are less prone to conflict amongst themselves.

The Youngest Child

The youngest child has no followers but many pacemakers. He is always the baby of the family, probably the most pampered, but the most stimulated one. He may become the most successful, however. The second largest proportion of problem children come from among the youngest, because all the family members spoil. They can never be independent. Sometimes, a youngest child may suffer from extreme inferiority feelings, everyone in the environment is older, stronger, and more experienced. On the other hand the youngest child may feel obligated to take care of his parents and also to be the person from whom they fund of. He may become the "boss" of the family and if not may retain the baby role. He may struggle to be taken seriously and be a decision maker.

The Only Child

The only child competes against his parents. He is pampered and scared to death lest he should have brothers and

sisters following him. He feels that it is his right to be the centre of the family. When he is no longer the centre of attention as an adult, he has many difficulties. He is always experiencing an atmosphere of anxiety because parents let him feel the message that "he is all they have". He usually accepts the values of his parents and is often highly ambitious and achievement oriented. He is often conservative and serious. He may have difficulty to work with a team; he is individual oriented.

Generalizations About Family Configuration

If there is five to six years of spacing between the birth of children, each child may have some characteristics of an only child. If a boy grows up in a highly masculine oriented family, and if he feels inferior as a male, he may acquire feminine characteristics. In contrast, a girl who grows up in such a family may emulate the behavior of boys. This feeling of not measuring up may prevail through their entire lives. Siblings have pleasant relations when they satisfy one another's needs. The more the family values include success and competition the more the degree of differences between the children in the same family. If a child is very successful in a certain field, the other will be interested in another area or he will give up the moment a sibling becomes interested in the same area, especially if the sibling is a success. We may say that each child tends to stay out of the other child's territory. However, each

child strives to be successful in his own area. In this way competition between two siblings is always expressed through differences in character, temperament, interest and abilities. Conversely, the similarity of characteristics always indicates alliances. Sometimes, the two strongest competitors show no sign of open rivalry, but rather present a close-knit pair though their competitive striving is expressed in personality differences.

The Role Taking of the Child in the Family

The role taking of the child in the family is another aspect of Adler's theory. The family is an ecological unit. Various factors may create a special role for siblings, mental retardation, brain damage, physical defect, and prolonged illness are examples of factors which lead to special roles. A family may have room for one good student, one helpful domestic girl, one black sheep son, etc. If a second child tries to be also a good student, or mother's favorite, or whatever, he intrudes upon a sibling's territory and conflict may ensue. And other times, one sibling may so outshine the others in some way that the other gives up.

Some roles are more available to one sex than to the others. One child may be unselfish, generous and the cheerful one, his sibling may be the bossy, critical achiever. The roles complement each other and therefore do not lead to significant conflict. The role of the black sheep is sometimes one of the most satisfying roles in the

family. It is a dramatic attention getter, a way of being impressive and important in the family.

The one who has lack of ability, may take the role of the failure in the family. He appears as the helpless one. He creates a need of helping and serving him. He will get much attention but little expectation. Usually this role lasts for a long time.

Part 2

Research Studies

Family Configuration and Intellect

The birth order study of possible effect of family configuration on intellectual development spans more than 100 years. Birth order, an integral concept in Adlerian theory, has been used extensively by Adlerians in clinical and assessment settings. Forer (1977) in a bibliography overview of birth order studies published 375 titles including 60 dissertations between 1970-1976.

Since Galton (1874) reported that first borns were over represented among eminent men of science, the findings of academic superiority of first borns has been replicated both in England and America.

Gerder (1894) in a study of 50 great men of the time obtained similar evidence, as did Gini (1915) who had studied Italian University Professors.

Ogburn (1927) concurs with this view as a result of data he obtained from "Who's Who" finding that the number of first borns respected by eminent men were greater than would be expected by chance. Hayes (1938) who studied Mt. Holyoke students, found that 62% of this sample were first borns. Many studies of birth order among older children and college students have generally demonstrated the superiority of the first borns over the later born child on measures of I.Q. and school achievement (Altus, 1966; Sees & Stewart, 1957; Maxwell & Pilliner, 1960; Rosenberg & Sutton-Smith, 1964; Schackter, 1963; Sutton-Smith & Rosenberg, 1970; Walker & Talmisiam, 1970).

A unique study by Belmont (1975) found that birth order was related to intellectual performance. The data, a record from the Dutch military preinduction examination, contained systematic physical, psychological and sociological information for approximately 400,000 young men born between 1944-1947. The psychological tests included, matrices, arithmetic and math, grammar and language, and the Binet Test. It was demonstrated that a birth order effect was present even when family size and social class were controlled. The first born had a better score on the average than did the second born, etc. The birth order effect was most consistent in families of two through four. Last borns have lower I.Q. scores at any given family size. Members of smaller families tended to have higher I.Q. scores. However, only children did not share this advantage. It should be

recalled that these findings referred to males only. However, the findings on intellectual competence are in accord with those from U.S. population of high schools in which a birth order effect was found for both females and males (Breland, 1974). The second of these large-sample studies was carried out by Breland, using almost 800,000 participants. He concluded that birth order is related to achievement and they are predominant among the highest achievers. Broley (1976) reported an overrepresentation of first borns in colleges throughout the country.

There is not always agreement concerning the causes of these consistent observations. Current interest in possible relationships between intellectual development and the family environment, suggests need for more research. Schooler (1972) found that first borns were overrepresented in the total number of births reported for these years. Thus, one would expect a high proportion of first borns in the college population of the 1960's. He also suggested to conduct more sophisticated research and to consider family size, and socioeconomic status as well as to correlate only birth order. Because family size tends to correlate negatively with socioeconomic status, he suggested that the observed birth order effects may be only an artifact. There have been many studies of this type, but usually with relatively small samples, and the population selected for high intellectual development tends to have more first borns than would appear to be normal. However, in a college population Barry & Gragg

(1976) reported that second borns with an older sibling of the other sex were under represented while those with an older sibling of the same sex were over represented. A sex role contrast and sex role modeling explanation was given. If the sister is a speeder, catching up with her older brother, it may threaten the boy's position as a male child. If the first child is a girl and is followed by a brother over whom the family fusses, she may develop a feeling of inferiority and may try to overcompensate through achievement, charm, cooperation, etc. Another study reported that there was no evidence for intellectual superiority of the first born. Jones and Murphy, Murphy & Newcomb (1978) made this conclusion upon reviewing over 100 studies. Roslyn & Bronzaft (1980) concluded that birth order does not appear to be critical to intellectual achievement if the families value education, and where the children are intellectually well endowed.

A number of explanations can be offered to understand the effects of family configuration on intellectual development.

Physiological Hypothesis, Edwards (1969), suggested that later born have lower intelligence because the parental environment is less nourishing for them, and therefore their mental development is lower. Although other hypotheses have been advanced there is little evidence that would support birth order related hypotheses.

Economical Hypothesis, Bayar (1967), suggested that first borns in general have greater access to family financial resources. However, economic hypotheses would also not seem useful in explaining the observed differences between only and first born children, and between children of different spacing.

Genetic Hypothesis, Lochlin & Nichols (1976), consider the considerable evidence that has been accumulated to suggest at least half the variance in intelligence among U.S. populations have genetic origins; there would appear to be no logic to suggest that there exist genetic differences among children of the same parents as a function of their birth order.

Demographic Hypothesis, Schooler (1972) and Grabil & Whelpton (1958) showed that during 1940-1950 the middle class was disproportionately overrepresented among those new starting families. Their first born would have higher I.Q. scores because middle class children tended to perform better than lower class children. But it is unlikely that the demographic hypothesis could explain greater intelligence for early born observed in a number of different countries over a lengthy time period. And certainly, demography could not explain the difference which has been observed within the same families.

Psychological Hypothesis, Breland (1977), claims this is the only one that seems compatible with the data. He believes that the first born has an added advantage, it would seem, because of his or her role as interlocutor between parents and younger siblings.

Zajnoc & Markus (1975) using those kinds of arguments tried to describe the relationship between family size, birth order, and intellectual ability in a sophisticated quantitative manner. They formulated what they termed the Confluence Model of Intellectual Development. Effects of sibling spacing, parent intelligence, sibling intelligence, parent absence, and the amount of contact among siblings and parents were measured.

According to Zajnoc it is the spacing of siblings, one possible key to anomalies, that have been noted in the data from different studies. Since most studies of family configuration effects have not examined the spacing factor, this may be one reason for the lack of consistency in reported data. The confluence model would predict that the only child would have the highest intelligence of all, but the data indicates that the first born child has higher intelligence than the only child. To explain it, they hypothesized that young siblings have the advantage from their older siblings who are teaching them, but the only child does not have this advantage. They were able to explain 97% of the variance in mean scores on the Raven Matrices test of I.Q. for the various family size and birth

order positions. Thus, strong relationship in aggreaged data may not appear when the individual scores are considered. Several recent studies have bearing on this point. In the Scottish survey Maxwell (1969) suggested that mean score decreased with increasing family size, but any difference for birth order was hardly detectable. Zajnoc (1978) suggested that the reason that this study does not agree with either Belmont (1975) or the Breland (1974) results, is that the birth rates in Scotland (Maxwell, 1969) during the years of birth of those in the sample, were relatively lower than the birth rates represented in the other study. Hunter & Breland (1977) suggested that one should collect the data as it was done in the Scottish survey. Over 90% of the entire population of 11 years old were tested in 1947 and a sample of these children were selected for follow-up studies over the next 16 years. By 1956 a total of 654 of the original sample had younger siblings who had reached age 11, and had taken the same test. Comparison of mean test scores showed a slight advantage for earlier born, but the difference was not considered to be significant. A similar study was conducted in England, Record & Edwards (1969), a sample of over 50,000 children was studied. Early borns had significantly higher I.Q. scores for all of the social classes except the highest.

Research Studies Summary

The conclusions from the research must be taken very

carefully. It seems, though, that most of them point out the importance of the birth order factor upon the development of the child. Intellectual development is related very strongly to birth order. However, in order to agree about specific results about birth order and intellectual development, in the future research, the attention has to be given to other variables, such as sex of sibling, space, social class, and so on.

Divorce or Parent Absence and Interaction with I.Q.

There are few empirical studies of the effects of father absence upon cognitive abilities as assessed by intelligence tests. Research findings report contradictory results. Herzog and Sudix (1973) concluded that the father's absence from home makes no difference to the child's school achievement. Other investigations have challenged this issue. Marybeth Shinn's (1978) evidence shows that in father-absent families or in families in which father has little supportive interaction with their children is often associated with poor performance on cognitive tests. The findings are generally consistent with hypotheses that children's interaction with their parents fosters cognitive development, and that a reduction in interaction hinders it. Anxiety and financial hardship in divorced families may also contribute to the observed effects.

Maxwell's (1978) study of 292 British Child Psychiatric Clinic Patients, aged 8 to 13 years, compared father present

children with father absent children. He measured them on the WISC-R. In his findings, no significant difference was found between father absence and scores on the Arithmetic subtest. On the other hand, a significant relationship was obtained between father absence and Coding subtest scores. Since Maxwell's data was not subdivided into sex groups, his data could not be re-evaluated to determine whether sex differences would account for some of the seeming discrepancies between his data and that of subsequent investigators. Maxwell did not focus upon the issue of why some subjtests, but not all, were lower among father-absent children. Lessing, Zagorin and Nelson (1978) found in 138 subjects (boys and girls who had been given the WISC-R as part of their routine diagnostic evaluation at a Child Guidance Clinic) a lower performance I.Q. score and lower scores on Block Design subtest, and Object Assembly subtest, regardless of sex or social class, and the boys had lower scores on the Arithmetic subtest. Moreover, working-class father-absent subjects also earned lower mean Verbal subtest, and Full-Scale I.Q. scores than had no father-absent subjects. However, among middle class subjects, the father-absent children earned a significantly higher mean Verbal I.Q. than no father-absent children.

Father-absent children with a stepfather in the home did not differ significantly from their father-present peers. As it was expressed well by Hess and Camara (1979) in their study

> For children, the threat of divorce lies in disruption of relationships with the parents. Disruption in these primary bonds interferes with the child's developmental progress and presents both cognitive emotional problems that may persist long after adjustments have been made in the routine of daily life. (p. 79)

It seems from the research that the threat of divorce or the absence of one of the parents, interferes with the child's developmental progress. However, there are contradicted findings on the result of the intellectual development of a divorced parent's child. This area still needs further investigation.

Moving

There is a question as to whether or not moving (changing homes in the same country) is related to differences in general cognitive development (intellectual) which may be less directly dependent on specific, immediate academic experiences. Although the North American lifestyle has been characterized by high mobility since the earliest days of settling, in recent years there has been rising concern about the impact, and in some cases even a tragedy of geographic mobility on the development of youth.

The concept of a rootless, alienated society has been described by Packard (1972) and Toffler (1970). They indicted that the mobility contributes to numerous psychological and social ills. It was assumed by educators and parents that there are possible negative effects of mobility on the cognitive development of children. However,

Goebel's study (1981) shows that, "Very few investigations of relationship between mobility and cognitive development have been carried out" (p. 15). Mankowitz (1979) indicated that most of the studies which do exist have focused on elementary school populations, and Misner (1973) indicated that the measures which have been done were mostly about school performance. Goebel's study (1981) suggested that higher rates of mobility during preschool, and lower rates during adolescence are associated with greater intelligence at adolescence. In this study it was concluded that relationships between moving and cognitive development, tend to be positive rather than negative. Families are relatively mobile during the early child-rearing years in an effort to become established. They generally have achieved this by the time their children are adolescent, becoming sedentary. Thus, the findings show that mobility during the preschool period is related to higher scores in intelligence, and also in achievement tests as it was shown by Goebel (1978). It is possible that there is a critical period during early life when mobility may serve as a stimulus to cognitive development, however, it might be that the contrary is right for the adolescents.

It seems to be a greater and more complicated issue than it appears in the research. The impact of moving on children at different ages must not be neglected. However, other variables should be considered as contributors to the moving factor such as, the age of the child at the time of moving,

birth order and sex.

Theories of Intelligence

Three Meanings Associated with Intelligence, and a WISC-R Definition

Since man began to think of himself, not as a part of the forests, and fields and the animals he hunted, but as an individual, he has struggled with an identity crisis. For thousands of years he has asked who am I? What am I? How do I know? And has produced magnificent answers, being sure of only one thing that there is always one more answer if he can discover the right question. In his striving for a truth that is immutable he has discovered soul and spirit, and intelligence. But what is it? How is it measured? And how is it defined? There are many theories of intelligence. This study will refer to three.

The First Meaning:

Hebb (1966) suggests that intelligence is used to mean the innate capacity of the individual, his genetic equipment. This form of intelligence can never be measured directly. It is termed intelligence A.

The Second Meaning:

Vernon (1969) suggests that intelligence refers to what the individual does, or to his observed behavior. It results from an interaction of genes with the prenatal and postnatal

environment. It is termed intelligence B. Vernon says

> Psychologically, intelligence B is the cumulative total of schemata or metal plans built up through the individual's interaction with his environment. Intelligence B can be lowered by constitutional handicaps, such as brain damage, and by environmental factors, such as social needs. (p. 23)

The Third Meaning:

Vernon (1969) suggests that intelligence C refers to the results obtained from an intelligence test.

The definition of intelligence continues to be a problem. Wechsler (1958) defined it as "The aggregate of global capacity of the individual to act purposefully, to think rationally and to deal effectively with his environment" (p. 7). If an individual, in the meaning he gives to life, wishes to make a contribution, and if his emotions and intellectual efforts are directed to this goal, he will bring himself into the best shape. He will approach the three problems of life (behavior toward others, occupation and love) and will develop his abilities. It is the striving for the solution of life's problems in the sense of the evolution of the individual. There are a million variations of the striving for a solution, and controlling of the situation. How does the individual relate himself to a situation? Adler pointed out, that social interest is an important aspect of his intellectual functioning in a given situation. "Social interest takes on the function of an important "non-intellective" factor in intelligence" (Ansbacher, 1935, p. 149).

According to Wertheimer (1945),

> It is an artificial and narrow view which conceives of thinking as only an intellectual operation, and separates it entirely from questions of human attitude, feeling and emotion. That kind of willingness to face issues to deal with them frankly, honestly, and sincerely . . . is very close to Adler's "Social Interest" concept.

Wertheimer goes on to say

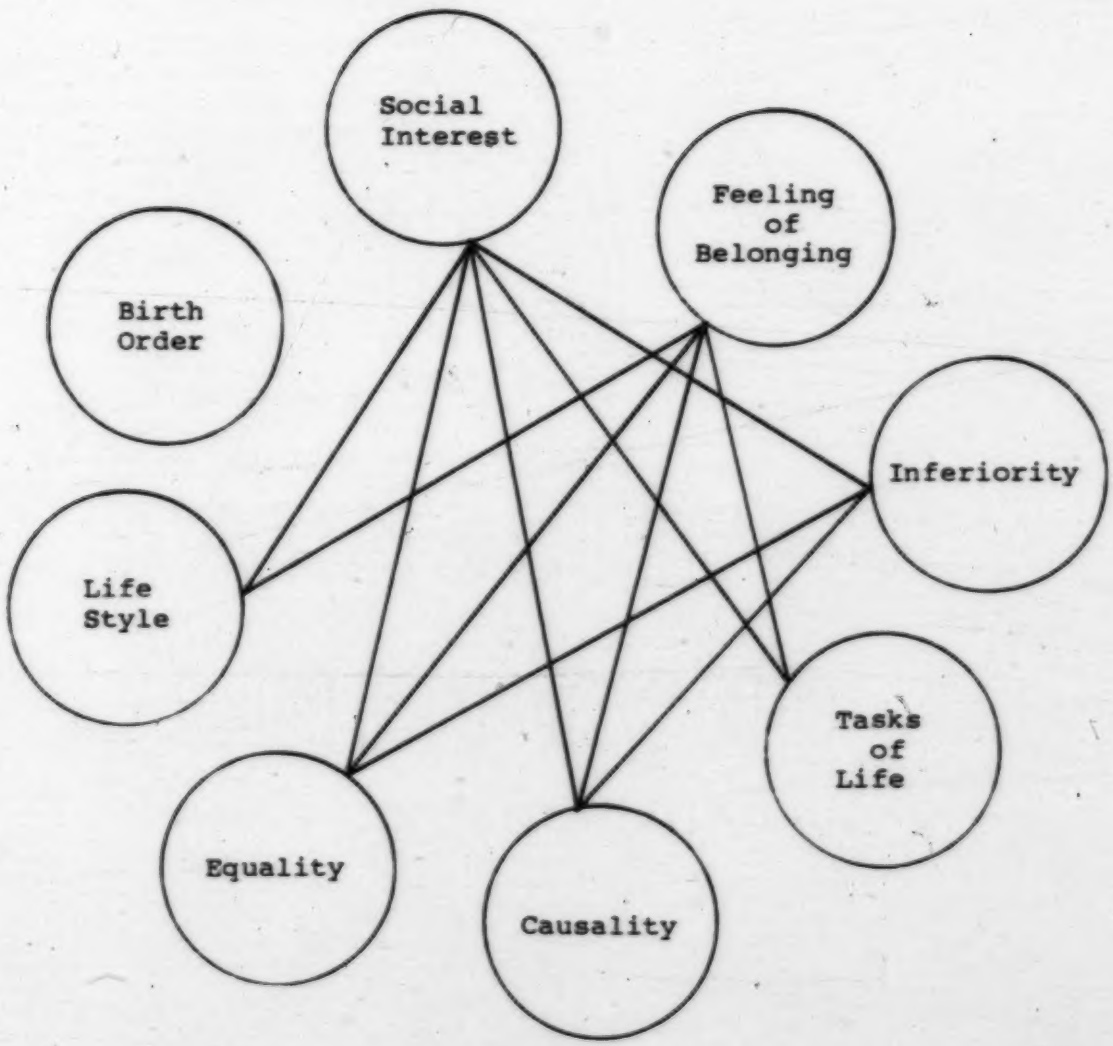
> Real thinkers forget about themselves in thinking. The proper problem-solving attitude is one of centering in the problem situation, including the social situation, rather than self. (1945, p. 89)

This is close to Adler's theory about the movement of an individual toward his goal by using his potentiality. Intellectual strength is a part of the individual's wholism, exactly as the social interest is a part of it. Both factors relate and interact to the same source, the individual as a whole.

Summary of Theory and Research Studies

Adler understood the individual as a whole. All the other factors are part of it, (see Figure 1) and they are interacted one with the other. Social interest is the natural result of the feeling of belongingness. The feeling of belongingness is a fundamental part of Adlerian theory. The feeling of belongingness is the essence of life, and the basis of it as well. Social interest is growing positively according to the positive feeling of belongingness or vice versa. The overall outcome of it is the life style. The life style appears to be the relationship of the individual

FIGURE 1



ADLER'S FACTORS ON THE WHOLISM OF THE INDIVIDUAL

toward his society in his environment. The source of it is the family, and the birth order, the interaction between the child and his parents, and his siblings. The life style is an interpretation about life that the individual gives. The question we might ask, is how does the individual approach the environment? Courageously or fearfully? How does he respond to his environment, such as social needs, achievements, expectations, etc.? How does he make use of his intellectual strength and his life style to handle situations in his life? It seems to be an interaction between the intellectual development of the individual and the way he reacts to his environment. In cases of changes in the environment of the child, like moving or divorce of parents, his feelings of belongingness are threatened. The possibility of losing, or having weak feelings of belongingness might be related to having less ability to respond to the environment. The ability to respond to the environment, we call and understand as the intellect. Thus, the losing of the feeling of belongingness might be related to the child's intellectual development. And thus we assume that the child's intellectual development is sensitive to changes and it can be shown by measuring it.

CHAPTER III

METHOD AND PROCEDURES

The Sample

The subjects in this study were 190 Canadian children referred to the Child and Family Clinic for intellectual assessment. All testing was carried out by supervised graduate students. There were two major reasons for referral. Forty-five percent of the cases of the sample were interested in the gifted program, and the rest were referred because of their low academic achievement in their class. The sample was comprised of 114 males and 76 females. The children were of middle-class homes, from inside and outside the City of Edmonton. The age of the children ranged from 6 years to 18 years (mean = 11.5 years; SD = 2 years), and their WICS-R Full Scale I.Q. ranged from 55 to 155 (mean = 101; SD = 15.88). Sample description is provided in Table 1.

Procedures and Instruments

WISC-R protocols were obtained from the clinical files of 190 children seen in 1982. The WISC-R was administered and three different factor scores were calculated. The Perceptual Organization score included the following subtests: Picture Completion, Picture Arrangement, Block Design, and Object Assembly; the Verbal Comprehension score

TABLE 1

THE MEANS OF THE FAMILY VARIABLES AND THE I.Q. OF CHILDREN

Variable	Mean	Standard Deviation
Birth Order	2	1.29
Age	year 11.5	3
Space Between Siblings	year 2	1.25
Family Size	2.7	1.32
I.Q. of the Sample	101	15.88
I.Q. of Divorced Group (48)	103	12
I.Q. of Not Divorced Group (142)	100	13
I.Q. of Moved Group (86)	98	16
I.Q. of Not Moved Group (104)	105	15.6

N = 190
F = 76
M = 114

included the following subtests: Information, Comprehension, Similarities, Vocabulary; the Freedom From Distraction score included the following subtests: Arithmetic, Digit Span, and Coding.

The data collected in this study was obtained by a questionnaire to the participants of the sample, and follow-up phone calls to each of the cases involved.

The information on the study variables, such as sex, age, the number of moves, and the marital situation of the child's parents were obtained by a questionnaire. Further information on the variables, such as birth order, family size, and the space between the siblings were obtained by phoning the participants of this sample.

In total there were seven independent variables (birthorder, size of family, sex, space between siblings, age, number of moves and divorce/not divorced) and four dependent variables, (I.Q., Full-Scale, and the WISC-R factors Freedom from Distraction, Verbal Comprehension, and Perceptual Organization).

Clinical Behavioral Data

The following information describes the kind of relationship that children have with their parents, teacher and with their peer group. This information was obtained by interviewing children, parents, and their teachers. The purpose of this report is to understand the children's behavioral patterns beyond the data previously presented in

this study. Ten cases from each group were randomly selected from two of the groups under study (the higher I.Q. group and the lower I.Q. group). In the first group (children who had not experienced moving or divorce) most of them had a higher I.Q. than the average score. In the second group (children who had experienced moving or divorce) most had a lower I.Q. than average score.

The Social Aspect

"He has lot of friends both at school and in his neighborhood at home." "He socializes very easily." "He is delightful to be with." "She is so happy to help others." "She always comes and asks for work." "She is eager to take responsibilities." "He is always with friends or doing some interesting job."

The Academic Aspect

"He enjoys learning new things." "His performance and behavior are excellent." "He enjoys reading, sports, and learning in general." "His assignments are always done, he tends to spend much time thinking before giving an answer." "She is eager to take responsibilities."

Below Average Children

Children who were referred because of having learning difficulties and low academic achievement, usually had a different background. Anecdotal comments such as, "Children

teasing him--this led to fighting" the result is resenting school; "He does not have any interest in anything that is objective in his grade"; "She seems to have lack of motivation to go out and do activities"; "Lack of self-confidence"; "The kids laugh at me when I come to the class"; "Nobody likes me;" "No one plays with me;" "She is not involved with the children to any degree"; "She has no friends in school" were evidenced.

The Academic Aspect

"He needs a lot of attention in order to do something"; "He did express a fear of failure"; "Many difficulties in her academic study and very poor peer relations"; "Poor concentration, few friends"; "Unmotivated and functioning below grade level".

Summary

The evidence indicates that children in the high I.Q. group appear to have a more positive attitude and interaction with their environment, and they have less problems in both social and academic areas than the children in the lower I.Q. group.

Analysis of the Data

The analysis of the data proceeded through a number of steps. The first analysis of the data involved computation of correlation coefficient between each of the family

factors (the variables in the study) and the I.Q., and between each of the family factors and the WISC-R's factors.

The second analysis of the data involved computation of means I.Q. of children of divorced and not divorced parents, females, males according to their birth order.

The third analysis involved computation of means I.Q. of moved - not moved children according to the above mentioned order.

The fourth analysis of the data involved computation of multiple linear regression of family variables on the criterion of intelligence (Full Score I.Q.).

Three more analyses of the data involved computation of multiple linear regression of family factors on the criterion of each of the three factors of the WISC-R.

Lastly, analysis of the data involved computation of a three-way analysis of variance between the subject factors of marital status, sex, and birth order, and between the subject factors of moved - not moved, sex and birth order.

Research Hypotheses

1. What is the relationship correlation of I.Q. to family variables such as marital status of the parents and movings, and birth order, family size, age, sex and space?
2. What is the relationship correlation of WISC-R factors to the family variables such as marital status of the parents and movings, and birth order, family size, age,

sex and space?

3. What are the differences in I.Q. scores between first borns, second borns, and youngest with related variables, such as, marital status of the parents, and the degree of mobility of the family?
4. How much variance is accounted for in the independent variables (e.g., family size, sex, space, age, birth order, marital tatus and mobility) in predicting the Full Scale I.Q.?
5. How much variance is accounted for in the independent variables (e.g., family size, sex, space, age, birth order, marital status, and mobility) in predicting the factors from the WISC-R?

CHAPTER IV

RESULTS

Descriptive Statistics

The sample in this study included 190 participants, 114 males and 76 females (see Table 1). The participants' age range was from 6.2 years to 17.11 years (mean = 11.5, SD = 3). The family size range was from 1 to 8 (mean = 2.7, SD = 1.32). The space between sibling range was from 1 year to 10 years (mean = 2, SD = 1.25). The sample included 48 children from divorced parents. Children from divorced families had an I.Q. range from 55 to 128 (mean = 103, SD = 12). In the not divorced group there were 142 children, their I.Q. range was from 93 to 103 (mean = 100, SD = 13). In the sample there were 86 children from families who had moved, and 104 children from families who had not moved. In the group that had moved the I.Q.'s range was from 91 to 103 (mean = 98, SD = 16), and in the group that had not moved the I.Q. range was from 93 to 141 (mean = 105, SD = 15.6). In the total sample of 190 participants, the I.Q. range was from 55 to 141, (mean = 101, SD = 15.88).

Correlations

It was hypothesized that there is a relationship between family variables, such as birth order, divorce, moving, and I.Q. Table 2 shows the correlations. The findings suggest

TABLE 2

CORRELATIONS OF FAMILY FACTORS AND I.Q.

Variables	Birth Order	Size	Sex	Space	Age	Move	Divorce	I.Q.
Birth Order		0.738	0.034	-0.018	0.198	-0.004	-0.141	-0.074
Size			0.023	0.018	0.164	0.039	-0.160	-0.056
Sex				-0.018	-0.134	-0.006	0.021	0.078
Space					0.094	-0.038	0.024	0.081
Age						0.082	-0.030	-0.073
Move							0.086	-0.268*
Divorce								0.017

N = 190
r>.13
p<.05
*Denotes statistically significant at p<.05

statistically significant correlation (-.26) between moving and I.Q. There are no significant correlations between other variables, such as birth order (.074), family size (.056), sex (.078) space (.081), age (.073), divorce (.017) and I.Q.

Table 3 shows the correlation between family factors and the factors of the WISC-R, namely Perceptual Organization, Freedom from Distraction, and Verbal Comprehension. The findings suggest no significant correlations (.25) between family size and PO, (.22) between space and PO. (.17) between birth order and PO (.16), between sex and PO (.15), between age and PO (.17), between moving and PO (-.17), and between divorce and PO (.06).

There are statistically significant correlations (.81) between birth order and size, (.70) birth order and sex, and between (-.32) birth order and divorce. There are statistically significant correlations (.31) between size and space, (.31) between size and age, (-.30) and between size and divorce.

The findings suggest no significant correlations between sex and FD (-.16), between moving and FD (-.16). There are no significant correlations between birth and FD (-.01), between family size and FD (.02), between space and FD (.02), between age and FD (-.05), between divorce and FD (-.09). The findings suggest no significant correlation between sex and VC (.15), between moving and VC (-.15). There are no significant correlations between birth order and VC (-.01), between family size and VC (.01), between space

TABLE 3

CORRELATIONS OF FAMILY FACTORS AND THE WISC-R FACTORS

Variables	Birth Order	Size	Sex	Space	Age	Move	Divorce	PO	FD	VC
Birth Order		0.815*	0.709*	0.259	0.258	-0.024	-0.326*	0.175	-0.015	-0.012
Size			0.014	0.313*	0.312*	0.022	-0.307*	0.249	0.026	0.013
Sex				0.113	0.024	-0.052	0.150	0.168	-0.225	0.153
Space					0.022	0.005	-0.008	0.222	0.029	0.049
Age						0.317	-0.211	0.156	-0.054	-0.083
Move							-0.171	-0.172	-0.166	-0.153
Divorce								-0.069	-0.091	-0.041

N = 50
r>0.28
p<.05
*Denotes statistically significance at p<.05

and VC (.05), between age and VC (-.08), and between divorce and VC (-.04). One interesting interpretation of the variable "number of moves" is that as the family increases its mobility, scores on the FD and VC factor tend to go down, thus affecting concentration, attention and verbal comprehension. This finding is supported by a significant correlation between number of moves and Full Scale I.Q. ($v = .26$, $p<.05$).

Divorced Sub-Group

The findings suggest (see Table 4) that the children from divorced families have an average of 3 points higher I.Q. score than children from not divorced families.

The boys from a divorced family have an average of 6 points I.Q. higher than boys from a non-divorced family. First borns from a divorced family have an average of 4 points I.Q. score higher than first borns from a non-divorced family. There is the same difference between the middle children from divorced and non-divorced families. The first born boys from divorced families have an average of 7 points I.Q. score higher than first born boys from non-divorced families. The middle boys from divorced families have an average of 9 points I.Q. score higher than girls from divorced families.

Moved Sub-Groups

The findings suggest (see Table 5) that children

TABLE 4

MEAN TABLE OF DIVORCED SUB-GROUPS FULL SCALE I.Q.

Sub-Group	Divorced		Not Divorced	
Sex	Female	Male	Female	Male
Children		103		100
Children	100	106	99	100
First Born		105		101
Middle		103		99
Youngest		103		100
First Born	104	110	101	103
Middle	96	105	93	102
Youngest	102	104	100	100

N = 190

TABLE 5

MEAN TABLE OF MOVED SUB-GROUPS FULL SCALE I.Q.

Sub-Group	Moved		Not Moved	
Sex	Female	Male	Female	Male
Children		98		105
Children	97	98	101	108
First Born		100		105
Middle		96		102
Youngest		96		106
First Born	98	98	103	113
Middle	92	99	93	107
Youngest	91	98	106	105

N = 190

from "not moved" families have an average of 7 points higher score than have children from moved families.

Boys from not moved families have an average of 10 points higher I.Q. score than have boys from moved families, and girls from not moved families have an average of 4 points higher I.Q. score than have girls from moved families. The first born children from not moved families (see Table 5) have an average of 5 points higher I.Q. score than have first born children from moved families. The middle born children from not moved families have an average of 6 points higher I.Q. score than have the middle born children from moved families. The youngest children from not moved families have an average of 10 points higher I.Q. score than have the youngest children from not moved families. The first born boys from moved families have an average of 15 points higher I.Q. score than have the first born boys from moved families. The middle born boys from not moved families have an average of 8 points higher I.Q. score than have the middle born boys from moved families. The youngest boys from not moved families have an average of 7 points higher I.Q. score than have the youngest boys from moved families. The youngest girls from moved families have an average of 15 points higher I.Q. score than have the youngest girls from not moved families.

Multiple Linear Regression Analysis

It was hypothesized to show how well the variables, such

as birth order, sex, family size, space between sibling, age, marital status of the parents, and mobility of the family would predict the children's I.Q. (a Full-Scale), and the scores of the WISC-R factors. The findings suggest statistically significant ($F = 2.64$ $p > .027$) multiple correlation (.30) between a linear combination of the family factors (the variables in this sample) and I.Q.

Table 6 indicates the order of significance of the family variables in predictions Full-Scale I.Q. As can be seen, the overall variance accounted for in predicting cognitive abilities is very limited (9%), hence one can state that in this sample, these factors have little practical significance in prediction of I.Q. Given the size of the sample, each family variable reaches statistical significance ($p < .05$). However, in practical terms, level of ability is not closely related nor predictive of Full Scale intelligence.

It may be of some value, however, in examining the first variable entering the predictions equation, namely, number of moves a family makes. This variable singly accounts for the major variance in predicting the Full Scale I.Q., and is significantly correlated with ability.

Tables 7, 8 and 9 present the information of family variables predicting specific cognitive factors of the WISC-R. None of the variables reached statistical significance in predicting Full Scale I.Q. Hence we can

TABLE 6

MULTIPLE LINEAR REGRESSION OF FAMILY VARIABLES ON THE CRITERION OF INTELLIGENCE (FSIQ)

Step	Variables	F-Value	P=Level	% Variance Acc't For	% Variance Added
1	Move *	14.62	.0002	7.29	7.29
2	Sex *	7.92	.0005	7.84	.55
3	Birth Order*	5.70	.0009	8.41	.57
4	Space*	4.53	.001	9.00	.59
5	Age*	3.69	.003	9.00	.00
6	Divorce*	3.08	.006	9.00	.00
7	Size of Family*	2.64	.012	9.00	.00

N = 190
$p<.05$
*Denotes statistically significant $p<.05$

TABLE 7

MULTIPLE LINEAR REGRESSION OF FAMILY VARIABLES ON THE PO (PERCEPTUAL ORGANIZATION)

Step	Variables	F-Value	P=Level	% Variance Acc't For	% Variance Added
1	Size	3.26	0.07	6.24	6.24
2	Moved	2.48	0.09	9.40	3.16
3	Sex	2.09	0.11	11.80	2.40
4	Age	1.85	0.13	13.90	2.10
5	Space	1.75	0.14	16.34	2.44
6	Birth	1.50	0.19	17.00	.66
7	Divorce	1.29	0.27	17.40	.44

N = 50
$p<.05$

TABLE 8

MULTIPLE LINEAR REGRESSION OF FAMILY VARIABLES ON FD (FREEDOM FROM DISTRACTION)

Step	Variables	F-Value	P=Level	% Variance Acc't For	% Variance Added
1	Sex	2.62	0.11	5.00	5.00
2	Moved	2.16	0.12	8.30	2.70
3	Divorced	1.56	0.21	9.05	1.25
4	Space	1.18	0.32	9.36	.31
5	Birth	0.96	0.45	9.63	.27
6	Size	0.80	0.57	9.85	.22
7	Age	-	-	-	-

N = 50
$p<.05$

TABLE 9

MULTIPLE LINEAR REGRESSION OF FAMILY VARIABLES ON VC (VERBAL COMPREHENSION)

Step	Variables	F-Value	P=Level	% Variance Acc't For	% Variance Added
1	Sex	1.18	0.28	2.35	2.35
2	Move	1.12	0.33	4.47	2.12
3	Divorce	0.87	0.45	5.30	.83
4	Birth Order	0.69	0.59	5.70	.40
5	Size	0.57	0.71	6.00	.30
6	Age	0.50	0.80	6.35	.35
7	Space	0.42	0.88	6.46	.11

N = 50
$p<.05$

state that these demographic variables are not significant in their prediction of specific cognitive abilities as measured by the WISC-R

Analysis of Variance Between Moving, Sex and Birth Order

It was hypothesized to show differences in I.Q. between moved children, and the variables of sex, and birth order. Table 10 shows that the variable of "moving" is statistically significant ($F = 6.25$, $p > .01$). There is also a statistically significant ($F = 5.34$, $p > .02$) difference in the variable of sex. Males who had not moved had a higher I.Q. than females who had not moved. Also, middle and first born males had higher I.Q.'s than females, whether "moved" or not. There is no difference in the interactions of the variables such as moving and sex, moving and birth order, sex and birth order, moving, sex, and birth order.

It was hypothesized to show differences in I.Q. between children whose parents divorced and the variables of sex and birth order. Table 11 shows statistically significant ($F = 4.57$, $p > .03$) difference in the variable of sex and I.Q. There is no difference in the variable of divorce and I.Q. and no difference in the interaction of the variables such as divorce and sex, divorce and birth order, sex and birth order, divorce, sex, and birth order with I.Q.

TABLE 10

ANALYSIS OF VARIANCE BETWEEN MOVING, SEX AND BIRTH ORDER

Source (Variable)	Mean Squares	F Ratio	Probability
Moving*	1469.98	6.25	.01
Sex*	1255.46	5.34	.02
Moving and Sex	301.10	1.28	.25
Birth Order	294.32	1.25	.28
Moving and Birth Order	154.10	.65	.52
Sex and Birth Order	179.30	.76	.46
Moving, Sex Birth Order	477.17	2.03	.13

N = 190
*Denotes Statistically Significant $p<.05$

TABLE 11

ANALYSIS OF VARIANCE BETWEEN
DIVORCE, SEX AND BIRTH ORDER

Source (Variable)	Mean Squares	F Ratio	Probability
Divorce	113.50	.436	.51
Sex*	1191.19	4.571	.03
Divorce and Sex	182.54	.701	.40
Birth Order	268.25	1.029	.36
Divorce and Birth Order	14.04	.054	.94
Sex and Birth Order	162.94	.625	.53
Divorce, Sex, Birth Order	14.62	.056	.94

N = 190
$p < .05$
*Denotes Statistically Significant $p < .05$

Summary of Results

Correlations

1. The findings indicated statistically significant correlation between moving and I.Q. Full Score. There were found no significant correlations between other family factors such as birth order, family size, sex, space, age, divorce and I.Q.
2. There were found no statistically significant correlations between family factors, such as birth order, family size, sex, space, age, moving, divorce and factors of factors of the WISC-R, namely, Perceptual Organization, Freedom from Distraction, and Verbal Comprehension. One interesting interpretation of the variable "number of moves" is that as the family increases the mobility scores on the factors FD and VC tend to go down, thus effecting concentration, attention and verbal comprehension.

The Regression Analysis

1. The findings indicated statistically significance of the family variables in predicting I.Q. Full Scale. The overall variance accounted for in predicting cognitive abilities is very limited (9%), hence even these factors have little practical significance in prediction of I.Q. in the given size of the sample, each family variable reached statistical significance. It might be some value, however, in examining the first variable entering

the predictors equation, namely, number of moves a family makes. This variable signly accounts for the major variance in predictors the I.Q. Full Scale, and is significantly correlated with ability.

2. None of the family variables reached statistical significance in predicting specific cognitive factors of the WISC-R.

The Analysis of Variance

1. The findings indicated that the variable of "moving" is statistically significant. There is also a statistically significant difference in the variable of sex. Males who had not moved had a higher I.Q. than females who had not moved, also middle and first born males had higher I.Q. than females, whether "moved" or not. There was found to be no difference in any other interactions of the variables.
2. There was found no difference in the variables of divorce and I.Q., and also no difference was found in any other interaction of the variables. But there was found a statistically significant difference in the variables of sex and I.Q.

The Means

1. Divorced Sub-Groups. The findings indicated that the children in any combination of the sub-groups from divorced families have an average of higher I.Q. score

than children from not divorced families.

2. Moved Sub-Groups. The findings indicated that children in any combination of the sub-groups from not moved families have an average of higher I.Q. score than children from moved families.

CHAPTER V

DISCUSSION AND CONCLUSIONS

Hypothesis 1. What is the relationship (correlation) of I.Q. to family variables such as marital status of the parents and movings, birth order, family size, age, sex and space?

Hypothesis 1 was partially confirmed. Based on the results of the correlation coefficients it appears that the moving factor correlated negatively with I.Q. The rest of the factors were not showing significant correlation with I.Q.

The negative correlation between moving and I.Q. may be explained by the diminishing of the feeling of belongingness which relates to the ability of the child to interact with his environment and thus to his intellectual development. The indication of a non-significant correlation between the divorce factor and the I.Q. might be explained; that in spite of the change in the child's life, his feeling of belongingness did not diminish as much as in a case of moving. Therefore, his interaction with the environment was not destroyed. The rest of the factors were not significantly correlated, possibly due to the fact that each of the family factors had a small effect by being represented in a small number of subjects (each of the birth order group was small, as was each of the family size group, etc.).

Hypothesis 2. What is the relationship (correlation) of WISC-R factors to the family variables such as marital status of the parents and movings, and birth order, family size, age, sex and space?

Hypothesis 2 was not confirmed. Based on the results of the correlation coefficients it appears that none of the family factors show significant correlation with WISC-R factors. This may be due to the fact that this hypothesis was tested on a small sample (N = 50). The moving factor related more strongly to the three WISC-R factors than the divorce factor. This would result from the overlap in the relationship of the I.Q. Full Scale to the calculation of the WISC-R factors. However, number of moves is most significant, more so than the divorce factors in affecting a child's general ability level.

Hypothesis 3. What are the differences in I.Q. scores between first borns, second borns, and youngest with related variables, such as, marital status of the parents, and the degree of mobility of the family?

Hypothesis 3 was confirmed. Based on the results of the means analysis and analysis of variances. Differences were found between all the combinations of the sub-groups of children with divorced and not divorced parents. The divorced groups have higher means scores than the not divorced groups. These findings are similar to the findings of Lessing, Zagorin and Nelson (1978) that the father absent children scored significantly higher mean Verbal I.Q. than father present children. This is due to the possibility that children of divorced parents feelings of belongingness does

not diminish in the case of divorce as much as it might in the case of moving, therefore the negative effect on their intellectual ability is less. The new situation, the divorce, challenges the child's creative power without destroying his feelings of belongingness.

Differences were found between all the combinations of the sub-groups of children from moved and not moved families. The not moved groups have higher mean scores than have the moved groups, and there is a statistically significant difference. This may be due to lack of the feeling of belongingness which relates to the ability of the child to interact with his environment, and thus to his intellectual development.

Hypothesis 4. How much variance is accounted for in the independent variables (e.g., family size, sex, space, age, birth order, marital status and mobility) in predicting the Full Scale I.Q.?

Hypothesis 4 was partially confirmed. Based on the results of the multiple linear analysis of family variables on the criterion of intelligence, it appears that all seven variables are contributing factors in predicting the child's I.Q. especially the moving factor. The rest of the variables such as birth order, space, age, family size and marital status were not strong factors in predicting I.Q., accounting for very little additional variance. Our findings support Geobel's (1978) findings about moving, that higher mobility during elementary and high school is associated with lower intelligence.

The factors such as marital status, birth order, space between siblings, age and family size were not contributing factors to predicting I.Q. Each of these factors had a small effect since small numbers are represented for each of the family categories.

Hypothesis 5. How much variance is accounted for in the independent variables (e.g., family size, sex, space, age, birth order, marital status, and mobility) in predicting the factors from the WISC-R?

Hypothesis 5 was not confirmed. Based on the results of the multiple linear analysis of family variables on the WISC-R factors it appears that none of the family factors contributes in predicting these WISC-R factors. This may be due to the fact that this hypothesis was tested in a small sample (N = 50). However, specific cognitive constructs such as those represented by these factors in themselves do not seem related to specific demographic variables. Overall level of ability, level of adaptation and adjustment to one's environment is affected by a variable like "number of moves" however.

Summary

The findings of this study indicate that I.Q. is sensitive to changes in the environment of the individual as it was shown.

Vernon suggested that

> Psychologically, intelligence is the cumulative total schemata or mental plan built up through

> the individual's interaction with his environment. (1969, p. 23)

Vernon's statement indicates what was found in our study that is a relationship between changes such as moving or divorce of the parents of the child and the intellectual development. In a case of moving the I.Q. tends to be lower, and in a case of divorce of the child's parents the I.Q. tends to be higher. In case of moving the individual's environment is completely changed and the result of it is the diminishing of the feeling of belongingness which relates to the ability of the individual to respond and to interact to his environment. As Adler expressed it "As long as the individual has a feeling that he belongs he can devote his energy to meet the needs of the situation" (1932, p. 183). The individual lacks the feeling of belonging after he moves, he is threatened by the new environment, and he feels like an "outsider". His ability to relate becomes less powerful and less successful.

In the case of divorce the focus is not on the feeling of non-belongingness, but how to cope with a more complicated situation, still his ability to relate to his environment intact.

The findings in this study indicate that there is not a relationship between family factors such as family size, age, sex, space between sibling, birth order and I.Q. This result may be accounted for by the fact that each subgroup was represented by a small number of subjects, and hence variations would not be as easily detected.

Thus, the findings of this study indicate that changes, like moving or divorce, in the environment of the individual life is related to his intellectual development. It is suggested that the existence or lack of the existence of the feeling of belongingness of the individual toward his environment may be the key ingredient in response to specific changes in the child's life, thus affecting his intellectual ability.

If we accept Wechsler's definition of intelligence as the aggregate of a global capacity to act purposefully and deal effectively with one's environment and Adler's proposition that belongingness is a fundamental construct in the feeling of wholeness, then this study has shown, in a limited way, that these propositions hold true. The findings of the present study did support Goebel's (1978) results. He suggested that higher rates of mobility are a decrease in intelligence during adolescence. The cross-sectional representation of age, including adolescence, in this study would suggest that mobility is affected at all ages. However, further research is needed to confirm these results, since the literature shows contradictory findings (Mankowitz, 1979; Misner, 1973).

Suggestions for Further Research

In terms of further research, the following implications exist:

1. A larger representation of each of the family factors is suggested. The sample should consist of a large number of subjects in each of the birth order groups both in the moved and in the divorced group.
2. A larger representation of the sex siblings groups is also suggested. It would be wise to establish controls for age interacting with sex of the subjects and sex of his siblings (e.g., first born boys age seven with older sisters age nine, etc.).
3. Further studies on factors from WISC-R (PO, VC and FD) should be included in a larger sample, within a large number of subjects in each of the family factors.
4. In further studies a large sample of children with divorced parents should be considered within a control of the length of time that the parents are divorced or absent.
5. Finally, in order to have more understanding about the interaction between specific I.Q. factors and family factors an analysis of variance should be carried out in a larger sample.

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APPENDIX A

COPY OF BIOGRAPHICAL DATA SHEET

Name _____ C.A. _____

Date _____ Sex M F Grade _____

	Original	Revised
Verbal IQ	/	
Performance IQ	/	
Full Scale IQ	/	

VERBAL TESTS (Original)		PERFORMANCE TESTS (Original)	
Information	____	Picture Completion	____
Similarities	____	Picture Arrangement	____
Airthmetic	____	Block Design	____
Vocabulary	____	Object Assembly	____
Comprehension	____	Coding	____
(Digit Span)	____	(Mazes)	____

I. REVISED ITEMS			ACCEPTABLE ANSWERS	REVISED	ORIGINAL
16.	(Inf)	Who invented the telephone?	Bell, Graham Bell	/	
17.	(Inf)	From what country did most of the first settlers in Canada come?	Scotland, Britain, England, France	/	
13.	(Inf)	Name two oceans that border Canada.	Arctic, Atlantic, Pacific (2 of 3)	/	
20.	(Inf)	How many weeks are there in one year?	52	/	
21.	(Inf)	In what continent is Denmark?	Europe	/	
24.	(Inf)	How tall is the average Canadian man?	5'7" to 5'11" 170 to 180 cm	/	
27.	(Inf)	How far is it from Montreal to Vancouver?	2000 to 3000 miles 3300 to 5000 km.	/	
10.	(Sim)	How are kilograms & Meters alike?	Measurements, etc.	/	
17.	(Comp)	What are the advantages of having senators and members of parliament?	Same as WISC-R manual	/	

II. Demographic Data (Answer all questions)

A. Basic Referral Problem (check one)

1. Classroom learning/achievement ..... _____(1)
2. Behaviour/emotional ..... _____(2)
3. Other (cerebral palsy, mental retardation, etc.) ..... _____(3)

Specify _____

B. Referral Person/Agency

1. Parent ..... _____(1)
2. School ..... _____(2)
3. Other (physician, social services, psychologist, etc.).... _____(3)

Specify _____

C. Change Situations

1. Has there been a change in marital status of the parents during the past three years? ..... _____Y1/N2

If so, specify: separation _____(1) _____
divorce _____(2)
death _____(3)
other _____(4)
Specify

2. Is the child currently living with his/her natural mother and father? ..... _____Y1/N2
3. Has the family moved during the past three years? ..... _____Y1/N2
4. How many different schools has the child been in during the past three years? ..... _____
5. How many different schools has the child been in since he/she started grade one? ..... _____
6. Has there been a death within the immediate family (siblings, parents, grandparents) or of a close friend during the past three years? ..... _____Y1/N2

If so, who? _____

7. Has a "best friend" of the child moved within the past two years? ..... _____Y1/N2
8. Has this child ever repeated a grade (including kindergarten)? ..... _____Y1/N2

If so, which one? _____

9. Has the child been separated from his family during the past 3 years? (eg. institutional placement, foster home). If so specify. _____..... _____Y1/N2

10. Please name the child's siblings, in order, by age and sex.

APPENDIX B

LIST OF THE WISC-R SUBTESTS AND FACTOR SUBTESTS

WISC-R SUB TESTS

VERBAL TESTS

Information
Similarities
Arithmetic
Vocabulary
Comprehension
(Digit Span)

PERFORMANCE TESTS

Picture Completion
Picture Arrangement
Block Design
Object Assembly
Coding
(Mazes)

The Perceptual Organization score included the following subtests:
- Picture Completion
- Picture Arrangement
- Block Design
- Object Assembly

Freedom from Distraction score included the following subtests:
- Arithmetic
- Digit Span
- Coding

Verbal Comprehension score included the following subtests:
- Information
- Comprehension
- Similarities
- Vocabulary